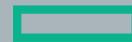




Best Practices For Workload Placement in a Hybrid IT Environment

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COMMISSIONED BY



Hewlett Packard
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About this paper

A Pathfinder paper navigates decision-makers through the issues surrounding a specific technology or business case, explores the business value of adoption, and recommends the range of considerations and concrete next steps in the decision-making process.

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I. Executive Summary

IT and business leaders are stepping up efforts to find the optimal workload placement in the evolving hybrid IT environment. Getting workload placement right is vital today because by making the right choices, organizations can optimize and better control costs while giving users the data and services essential to growing and developing the business. In addition, a workload-specific approach can help bridge the divides often found between IT, developers and lines of business.

We define hybrid IT as an infrastructure combining traditional workload deployments with software as a service (SaaS), public, private and managed cloud resources – essentially a blend of hybrid cloud and traditional IT. Today, workloads are still placed most often in traditional or non-cloud infrastructure (59%) compared with cloud workload deployments (41%). This mix will change dramatically in two years, essentially reversing the workload figures to 59.5% of workloads deployed in the cloud and 40.5% deployed on non-cloud infrastructure. (Source: 451's Voice of the Enterprise: Cloud Computing Report, Q1 2016)

However, there is no single cloud but, rather, several models that compose the cloud in the hybrid IT environment. Business drivers, such as changing regulations or efforts to aggressively control costs, can heavily influence workload placement in the hybrid IT world. Also, there are many workloads deployed to non-cloud environments that will likely stay there owing to a variety of factors – for example, some workloads are simply not 'cloud ready' so would need very costly reconfigurations to run properly in the cloud. The bottom line is there are no easy answers to the challenge of workload placement, for several reasons:

- The hybrid IT environment is highly dynamic. User organizations are continually orchestrating the movement of workloads among options including on-premises private cloud with a hosted private cloud; on-premises private cloud with a public cloud; hosted private cloud with a public cloud; and others such as SaaS, where the workload may be hosted on a vendor or partner cloud.
- Business factors driving the shift of workloads to the different cloud models are themselves continuously changing as the competitive landscape changes, and requirements for cost savings, performance gains and compliance/regulation change.
- Workload options are changing, particularly as certain workloads previously hosted on private clouds are increasingly available from reliable third parties as SaaS offerings.
- Finally, we have observed a trend in flat IT budgets overall. However, IT leaders report modest to significant increases in cloud spending in roughly half of all organizations we polled in our 2016 Voice of the Enterprise research study of 1,000 IT decision-makers in the US and Europe.

NO EASY ANSWERS TO WORKLOAD PLACEMENT

Given the highly dynamic nature of this cloud and workload environment, we firmly believe there is no broad answer or 'cookbook solution' to the question of optimal workload placement. Decisions around deployment models will remain similarly dynamic and will initially involve significant trial and error based on the individual application profiles (e.g., lifecycle stages, usage patterns, application behavior characteristics, data criticality and data-sovereignty considerations). Given that the decision-making process for workload placement plays out across multiple IT and business vectors, organizations can apply the lessons of the trial-and-error approach to establish iterative workload-classification IT-deployment 'scoring' frameworks that take into account the performance, security, compliance and IT governance requirements of workloads on a case-by-case basis.

The objectives of this paper are:

- To present a high-level understanding of the factors, particularly the business drivers, influencing placement of workloads within cloud and non-cloud environments, noting the different cloud models available.
- To demonstrate both current and projected workload-placement plans against which an organization can measure its own plans.
- To provide guidance for businesses contemplating new workload placements.

II. Top Five Factors Determining Workload Placement

Although the drivers of workload placement may vary widely from one organization to another, several leading drivers have emerged. Cost, IT and business control, security, and workload/application performance are key drivers for organizations that have considered various deployment options, including public cloud, private cloud, SaaS, IaaS and traditional non-cloud environments. Depending upon the vertical market, compliance/regulation also can be a key driver of workload-placement decisions.

COST

While the long-term benefits of hybrid IT are business and IT agility and seamless scalability – 78% of organizations we polled said cloud workload placements (all cloud models) will increase the ability to respond to shifting business needs – 62% of organizations said they believe cloud will increase business revenue. But it is **cost** that almost always enters into the workload-placement equation. In fact, among the quarter of those organizations that are migrating workloads from public to private clouds, cost is cited as the leading driver.

Sixty-one percent of organizations we polled expect a decrease in hardware spending resulting from on-premises cloud, with the savings accruing from decreased server, storage and network spending. Much of these anticipated savings will result from a marked decrease in total physical server count, with 68% of organizations expecting a net decrease in physical servers as the cloud matures to accommodate a greater percentage of virtual servers. So not surprisingly, many organizations – 41% – expect continued on-premises workload placement to result in **increased** server virtualization spending, but these increases will be more than offset by the aforementioned hardware savings. The bottom line is that substantial hardware savings accrue from virtual server deployments.

Resource utilization and manpower efficiency are key metrics to consider in workload placement in the hybrid IT world when it comes to control. The better utilized the private cloud – how close that utilization is to 100% – the lower the unit cost per virtual machine. Organizations with significant unused capacity can leverage private cloud to support additional workloads with no further hardware purchases. The greater number of virtual machines an administrator can manage, the lower the unit cost of each virtual machine. Just remember that while manpower is a critical component in a TCO calculation, it is also very difficult to measure.

These findings highlight the continued relevance of on-premises workload placement (both cloud and non-cloud). Enterprises that run largely on traditional IT architectures cannot simply write off existing investments and shift to ‘asset light’ public cloud models. Organizations must take a TCO view of the various hybrid IT options, factoring in both capex and opex elements, as well as training and personnel considerations. In many cases, cost optimization of the on-premises private cloud environment combined with burst capacity to public clouds will prove to be a more economical and less disruptive approach than all-in public cloud migration. TCO calculators and other easy-to-use tools to compare IT deployment options can greatly simplify decision-making, but the efficacy of such tools depends greatly on an organization’s ability to identify and measure IT usage.

That said, our Voice of the Enterprise: Cloud data shows that cost considerations usually are the second or third key driver for deploying workloads to non-cloud infrastructure in hybrid IT environments. Very often, workloads already running in non-cloud infrastructure cannot be moved to the cloud without significant, often costly, revamping. At other times, the workloads may have been initially deployed years or even decades earlier, further complicating the chore of pouring through aging documentation to prepare them for the cloud. It often just isn’t worth it unless the plan is to scrap the workloads entirely and re-architect them from the ground up for cloud – another costly process that must be carefully weighed against the benefits of doing so.

AGILITY AND RESPONSE TO SHIFTING BUSINESS CONDITIONS

Early on, the key (and often only) driver of deploying workloads to cloud models was cost savings on both capital spending and operating expenses. Over time, other important business benefits have emerged, including increased agility and more rapid response to shifting business conditions. In virtually every one of the 16 workloads we studied in our 2016 Voice of the Enterprise survey, the top reason for deploying to the cloud was ‘respond faster to business needs.’

Interestingly enough, this same driver of faster response to business dynamics was consistently cited as the number two or three driver for deploying workloads to non-cloud environments across a wide variety of workloads we examined. We believe the reason is the high level of familiarity the IT staff has with these workloads, which have been running for a decade or more in some cases. This ‘legacy experience’ facilitates more fluid changes in response to shifting business requirements.

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However, we maintain that when it comes to deploying new workloads, careful consideration of cloud deployments is mandatory given the significant benefits derived as cloud models mature.

Deploying workloads to cloud models can compress time to market with new application development because doing so obviates the need for protracted hardware and software acquisition cycles (except in the case of on-premises private cloud). For vertical markets such as high tech and business/consumer services, this agility delivers clear dividends and competitive advantage. Organizations in these verticals were most likely to be 'cloud first' (i.e., using cloud computing as the de facto IT platform). They emerged as the heaviest adopters of public cloud, and they have the most varied approach to hybrid IT, using different combinations of on-premises private, hosted private and public cloud environments. In verticals such as manufacturing, gas and utilities where agility is not as significant a driver of cloud adoption, organizations lean more toward the use of on-premises private cloud environments.

The important thing is for individual organizations to determine the actual business value of faster time to market before making a workload-placement decision predicated on it.

CONTROL/IT CENTRALIZATION

Taken together, these two related factors represent the top drivers for private cloud environments – both for the initial deployment decision and as motivators for migration from public cloud environments. We believe that hosted and on-premises private cloud options will emerge as the deployment model of choice for traditional business application workloads moved to the cloud. These models give confidence to organizations that are concerned about security and governance in public cloud environments. With regard to the latter, private cloud environments (both hosted and on-premises) provide organizations with greater scope to apply consistent access and usage policies across the organization.

Resource utilization and manpower efficiency are also key metrics to consider in workload placement (in addition to cost considerations) when it comes to control and IT centralization. As mentioned, the better utilized the private cloud, the lower the unit cost per virtual machine. However, increasing consolidation of IT environments also yields more streamlined IT governance, making private cloud environments the best deployment option for organizations seeking high levels of control.

SECURITY

Without question, the major public cloud providers have a relatively large number of security specialists with much exposure to and experience with combatting global threats, which should make for a highly secure cloud environment. By contrast, even the largest enterprises cannot match this aggregate skill set and threat knowledge base.

That said, as a generalization, public cloud providers are responsible for the security of the cloud, which does not necessarily equate with the security of your workload. What happens to the data as it moves throughout the enterprise workload process needs special attention when the public cloud is involved in some of the steps in that process. So, for workloads involving data that IT and the business have previously identified as being highly sensitive, on-premises deployment environments (cloud or non-cloud) should be the default.

Security is by far the top driver for workloads in non-cloud infrastructure. In fact, in 18 of the 19 workloads we surveyed, security was listed as the top driver, very often by a wide margin over the next two (cost and rapid business response). This makes sense. For one thing, in vertical markets such as healthcare and financial services, regulation and compliance factor greatly in workload-location decisions. In healthcare, for example, an entire cottage industry has sprung up based on helping healthcare organizations build 'HIPAA-compliant clouds,' with HIPAA being the main regulatory body of rules. While HIPAA won't explicitly spell out what actually defines HIPAA compliance with cloud workload deployments, the default often is to continue running the most sensitive workloads in non-cloud environments, or perhaps in private on-premises cloud configurations. We believe the same will continue to hold true for other industries where there is a strong sense that security is optimized in non-cloud infrastructure.

REGULATION AND COMPLIANCE

The various exigencies of regulations and compliance make relatively easy work of the workload-placement decision. Take the highly regulated healthcare environment, which is shaped by HIPAA requirements. While HIPAA does not explicitly state what kinds of data may or may not be hosted on the various cloud types, it does set forth potentially huge penalties if access to and the integrity and safety of personal health information has not been protected to a very high standard.

In such a closely regulated environment, large-scale workload migration to the cloud must be carefully scrutinized, usually with a detailed cost-benefit analysis. Over time, we believe that regulators in general will become more confident in and

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comfortable with cloud security. Regulators may even overtly bless certain cloud configurations given their potential to cut costs. For now, however, IT leaders in highly regulated sectors should proceed with caution when it comes to deploying workloads in cloud environments, particularly in public clouds. On-premises private cloud and traditional non-cloud IT might be better options for workload deployment in such cases.

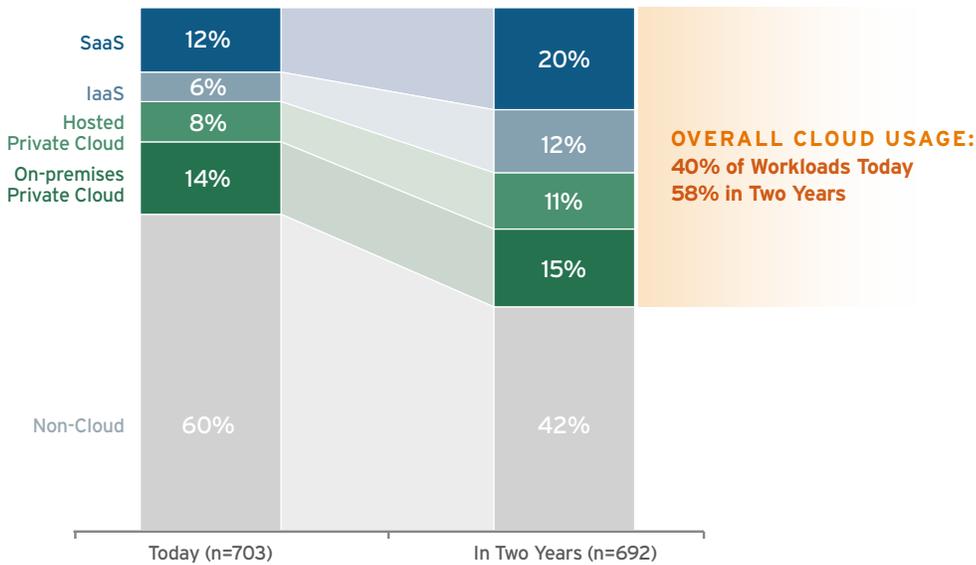
III. Common Workload Placement Patterns

Our research shows that cloud models are becoming the go-to infrastructure, especially for newer workloads. As shown in Figure 1 below, organizations expect to realize dramatic growth in the shift of workloads to cloud models in the next 24 months. The more than 40% of workloads currently deployed in the cloud will grow to 57% in two years, while off-premises workloads will grow from 26% of total workloads today to 42%. Workloads deployed as SaaS will nearly double in this time, reaching 19.5% of all workloads by 2018. Deployments to infrastructure as a service (IaaS) will more than double to nearly 12% of total workloads.

Figure 1: Workload Placement Patterns

% of Workloads Running in Cloud (Cloud Familiar Respondents)

Source: 451 Research, Voice of the Enterprise, Cloud Workloads and Key Projects 2016



But despite what you may have heard and read, workload placement to any of the multiple cloud options is far from simple or easy. The sheer number and types of clouds and cloud options – public, hosted private, on-premises private, SaaS, IaaS, hybrid, interoperable, etc. – make the vital decision of workload placement anything but simple.

CLOUD MODEL DEFINITIONS

With **SaaS**, software is licensed on a subscription basis and is centrally hosted. It is usually available on demand or as needed and accessed by users through a browser or dedicated client.

IaaS provides virtualized computing resources (storage, servers, etc.) over the internet.

Hosted private cloud provides a single-tenant environment where external hardware, storage and network resources are dedicated to a single organization.

In **public cloud**, a service provider makes a broad range of services and resources, such as applications and storage, available to the general public over the internet.

In an **on-premises private cloud**, hosting occurs in an organization's own datacenter, yielding better security and standardized processes while being limited in size and scale.

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Different cloud models offer different potential benefits, and organizations recognize the possibilities offered by the variety of options, as our research demonstrates further. Figure 2 shows that SaaS users are seeking primarily to reduce their management headaches while reducing the burdens of management on IT staff. Those deploying workloads to IaaS are interested in scalability to meet peak demand while accruing hardware savings and faster time to market.

Figure 2: Key Factors in Choosing Various Cloud Models

Q. What are the key factors in building a business case for different cloud models at your organization?

	SaaS	IaaS	Hosted Private Cloud	On-Premises Private Cloud
Hardware Cost Savings	28%	42%	42%	37%
Less to Manage Internally	55%	36%	37%	21%
Scalability/For Peak Demand	23%	44%	32%	29%
Speed/Time to Market	33%	41%	24%	30%
Improved Availability/Uptime	25%	31%	26%	36%
Staff Savings (time, FTE, skills)	35%	27%	29%	24%
Improved Security	11%	13%	27%	39%
New Functionality	33%	12%	14%	13%
Software Licensing Savings	21%	9%	11%	11%
Geographic Location	6%	12%	16%	15%
Create New/Additional Revenue for the Location	8%	10%	10%	9%
Sample N	739	420	378	491

SEEKING SECURITY AND COST REDUCTIONS

Meanwhile, organizations deploying to a hosted private cloud model also seek reduced hardware costs in addition to a reduction in overall management overhead.

Cloud is synonymous with aggressive virtualization, which lowers overall hardware costs. Finally, deploying workloads to on-premises private cloud comes with an expectation of security as well as enhanced availability and uptime resulting from the hands-on involvement of internal IT staff.

We believe the hosted and on-premises private cloud options will emerge as the deployment models for traditional business applications that are moved to the cloud because these options deliver confidence for organizations concerned about public cloud security. These models may also be more viable for traditional workloads that don't have the demand variability or configuration uncertainty that can make public cloud so appealing.

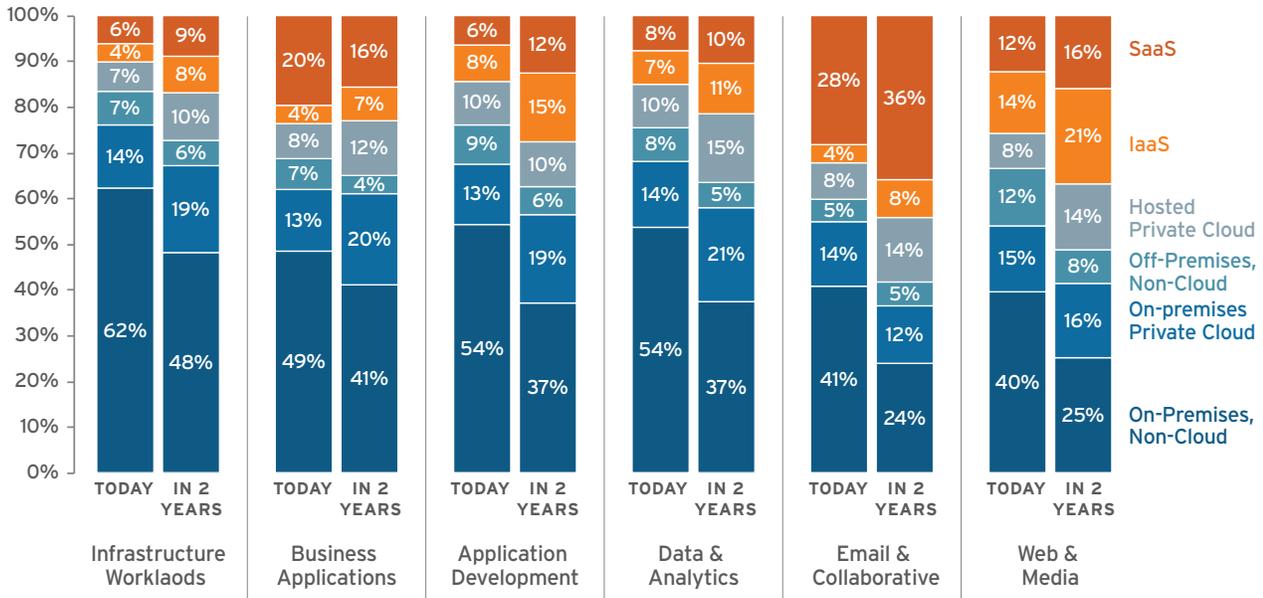
A senior IT manager at a major financial institution highlighted the need for security combined with agility by touting hybrid cloud as a more 'pragmatic' solution than 'all-in cloud.' Innovative projects that require fast deployment are natural candidates for public cloud, but the risk is too great for the volume of sensitive data in hardened on-premises systems to be moved to public clouds. A senior manager at a high tech company commented on the lifecycle management benefits of the hybrid IT model, citing the utility of public cloud environments for testing/development and initial production deployments, and the potential need for shifting to private infrastructure environments when the workloads get too big and the costs become 'unbearable.'

Figure 3 below offers more granular insight into the current and projected workloads deployed to the cloud. With the exception of shared IT workloads, a majority of every other workload will be deployed to the cloud within two years, compared with no majorities of such workloads today. This is a clear testimonial of the enthusiasm for cloud, which is further reflected in IT spending plans. While overall IT spending is largely flat in most organizations, our research shows that cloud spending, even in the short term (90 days), will increase in half the companies polled.

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Figure 3: Current and Projected Workloads Deployed to the Cloud

Q: Where in the hybrid IT environment are you deploying the following workloads, both today and expected in two years?



SAAS TAKES OFF

Figure 3 above shows growth in workloads deployed to SaaS in the next two years averaging more than 50% across all workload types surveyed. In two years, 20% of all workloads will run as SaaS. The workloads most aggressively deployed to SaaS are email/collaborative (45%) and business applications (30%). Common SaaS examples are Salesforce, Google Apps and Workday. Below is a closer look at the details of cloud workload deployments for three common workloads: email/collaboration; application development; and database/warehousing.

EMAIL/COLLABORATIVE WORKLOADS

The number of email/collaborative workloads deployed to on-premises non-cloud configurations will fall precipitously, with only one-quarter of such workloads remaining in these environments two years out. Security is cited as the main reason for keeping this workload in-house in organizations that do so. Organizations choosing a mixture of cloud and non-cloud environments to handle these workloads cite decreased costs and more rapid response to shifting business requirements as the reasons for doing so.

An IT manager at a mid-sized healthcare company justified the move to SaaS-based email, citing the need to have IT resources free to address business needs rather than managing in-house email servers – a capability that yields no advantage in the marketplace.

Email/collaboration is a good example of a workload that is vital to business operations, but one that yields no significant business differentiation and requires considerable effort on the part of IT. As such, it is a good candidate for SaaS deployment given its ubiquity of use and general lack of customization.

APPLICATION DEVELOPMENT WORKLOADS

The percentage of app/dev workloads deployed to SaaS and IaaS public cloud models will vault from 14% to 26% in two years, reflecting fast-growing confidence in the ability of third-party providers to service these mission-critical workloads. However, it is important to point out that 47% of application development workloads will still reside in non-cloud environments two years from now. The sheer volume of activity and security considerations around app/dev projects involving sensitive customer or systems-of-record data may keep some organizations' app/dev in non-cloud environments. Organizations using hybrid IT models that combine cloud and non-cloud environments for app/dev workloads cited reliability and availability, decreased costs and greater business agility in equal measures as reasons for going this route.

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Those opting for a cloud-only approach also cited greater business agility and improved reliability and availability, but they did so in much greater numbers. Our research consistently reflects the belief that cloud models in general offer an *improved ability to respond to changing business needs*; thus, it is a principle driver of shifting workloads to the cloud in the aggressive manner seen.

DATABASE/DATA WAREHOUSE WORKLOADS

Finally, the percentage of database/data warehousing workloads deployed in on-premises non-cloud environments will tumble from 58% currently to 39% in two years, while deployments to on-premises private cloud will remain unchanged. Meanwhile, deployments to all forms of off-premises cloud are set to expand substantially, accounting for 43% of database/data warehousing workloads. Given the highly sensitive nature of data used in these workloads, organizations currently running databases and data warehouses in non-cloud environments cite security as the chief reason for doing so. Yet, security concerns notwithstanding, the impressive and rapid movement of these workloads (or components thereof) to off-premises clouds is undeniable as organizations tap into the flexibility, scalability and 'opex not capex' benefits of cloud.

IV. Getting Workload Placement Right

In Figure 4, we see that different organizations will be making different decisions when placing workloads within the hybrid IT environment in the next two years. Organizations favoring multi-hybrid environments for interoperability are clearly leaning toward placing workloads in on-premises private cloud with a hosted private cloud. We believe the leading edge of the pack will opt for a hybrid approach of using multiple clouds to deliver a single business application or function seamlessly across all clouds.

Figure 4: Workload Placement within Hybrid IT Environments

Q. Which of the following best describes how your organization will use different on-premises & off-premises cloud environments over the next two years? n=902

We will focus primarily on a single cloud environment, not multiple clouds

32% Single Cloud

We will have multiple cloud environments, but there will be little to no interoperability between the cloud environments

32% Multi-Cloud

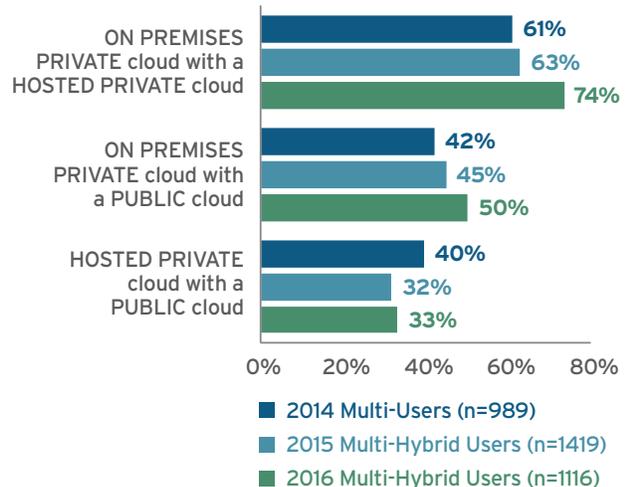
We will have multiple cloud environments to migrate workloads or data between different cloud environments

22% Multi-Cloud+

We will have multiple cloud environments where the delivery of a single business function across the different cloud environments is seamless

15% Hybrid

Q. Has your organization configured any of the the following clouds for interoperability?



Source: 451 Research, Voice of the Enterprise, Cloud Computing Workloads and Key Projects 2016

CLOUD OR NON-CLOUD DEPLOYMENT?

The rush to cloud and the very real cloud benefits notwithstanding, there are some workloads that should stay put in so-called traditional, non-cloud infrastructure environments. For example, the classic use cases for public cloud involve workloads requiring huge computing resources that are run infrequently and mobile applications. However, as businesses migrate key business applications to SaaS (primarily email/collaboration and customer relationship management), public cloud adoption is picking up (both IaaS and SaaS).

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In addition, net-new workloads featuring significant iterative development, testing and prototyping for digital customer-facing business initiatives are migrating to the public cloud deployment model to tap into improved time to market/business agility, IT elasticity and geographic reach.

However, we believe there are broad categories of workloads that are markedly less appropriate for cloud environments (public or private) – for now, at least. These include workloads such as shared IT, which often involve performance-sensitive custom applications designed to run internal production or operations-monitoring processes; latency-sensitive workloads that make frequent or very large queries against on-premises databases; and, of course, workloads involving highly proprietary data, the breach of which would present extreme regulatory or legal risk.

Then, of course, there are workloads that are not ‘cloud ready,’ such as legacy applications and workloads not currently supported by cloud providers. These legacy workloads may indeed be hard to manage, costly to operate and even unreliable. But unless they are replaced with a forklift upgrade, moving these workloads to any cloud could actually degrade performance; leave them where they are for now.

A senior IT manager at a high tech company mentioned the impracticality of migrating the organization’s proprietary workload to cloud environments due to the size of the systems and the static nature of the workload itself, as well as the lack of value, given the inability to leverage the flexibility and scalability inherent in cloud environments.

That being said, packaged business applications such as email and customer relationship management, which typically have broad usage profiles within organizations (and often across geographies) and which are periodically enhanced with new features and functionality, can better deliver on both the IT and business value of cloud in public or hosted private deployments.

TOUGH DECISIONS, MANY CHOICES

As mentioned earlier, the decisions regarding workload placement given the wide variety of choices are as complex as they are mission-critical. Our research shows clearly that going it alone when it comes to cloud and workload deployment is not the option most organizations will choose. Nearly half of organizations report that they currently face a skills shortage in cloud computing expertise, with 75% of organizations also citing ‘significant’ or ‘moderate’ difficulty in recruiting experienced cloud computing personnel.

The skills are out there, but as an IT engineering manager at a large services organization stated, ‘it’s going to cost you.’ Given this situation, IT leaders need third-party partners that can not only support but also transform the current IT environment, providing cloud-assessment services that help organizations prioritize workload migration, supporting workload-placement decisions, and operating/managing hybrid IT environments with services that deliver end-to-end interoperability, security, performance, visibility and governance.

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FINAL THOUGHTS

451 Research believes that continued expansion of cloud adoption and usage will both simplify and complicate the lives of enterprise IT managers. The flexibility and scalability of cloud models provide a dynamic rapid-provisioning environment for net-new business initiatives and the workloads that support them. However, organizations' business processes are increasingly composite in nature. The web front end of a workload (typically the user-engagement component) may well need to leverage the scale-up/scale-down capabilities of public clouds, but the back-end systems of record, such as proprietary databases with sensitive company or customer information, may be better suited to on-premises or hosted private cloud environments.

The ability to mix and match deployment choices within hybrid environments allows organizations to establish a balance between public cloud flexibility for developers and IT-savvy line-of-business managers, and centralized governance and control for IT managers and operations personnel. To the extent that IT organizations can incorporate flexible, agile public cloud services into formalized IT procurement, management and governance processes, hybrid cloud enables a situation where IT takes on a more strategic role of optimizing access to the internal and external IT resources that run the business – serving as a business enabler in the evolution toward agile IT.

In conclusion, organizations in search of the 'right mix' in their evolving hybrid IT environment should keep in mind key technology, business and organizational considerations, including the following:

SET THE RIGHT TONE: How are the needs of the various IT stakeholders (IT buyers, decision-makers, administrators and end users) within the organization being met – or not – within the existing IT environment? Transformation-oriented IT leaders can set the tone by positioning themselves as enterprise IT architects whose role is to ensure that the IT environment is optimized, stable, centralized and secure, but also dynamic enough to serve both IT operations and IT-driven business requirements.

BRIDGE THE DIVIDE: IT environments must be sufficiently agile and flexible to respond to shifting business conditions and competitive imperatives. As business operations (both internal- and external-facing) become increasingly digital, IT leaders must bridge the divide between IT, developers and lines of business. This requires a workload-specific approach that balances the IT organization's need for security, manageability and visibility with the speed, agility and elasticity that developers and IT-savvy line-of-business users need to pursue competitive advantage through digital transformation.

WEIGH YOUR OPTIONS: However, IT leaders in all sectors (particularly those in highly regulated industries) should approach IT transformation and the migration to cloud models with caution, beginning with workload-by-workload assessments that weigh the business benefits of cloud (particularly public cloud) with IT security, management, operations and governance issues.

DETERMINE YOUR RIGHT MIX: Which workloads work best in which cloud – public or private – (or non-cloud IT) environments? In the real world, existing (and not fully depreciated) IT system investments cannot simply be written off. Instead, IT leaders should take an evolutionary approach to their IT environments and deconstruct their workloads in a way that allows components of those workloads (databases and the data tier, web front ends, business process tiers) to be placed in the environment that provides the right mix of cost optimization, security, performance insurance and business agility.

GET HELP DEFINING YOUR RIGHT MIX: There is enormous expertise in workload-placement strategies and justifications for undertaking them within the vendor/trusted partner community. Leveraging this expertise can bring a significant measure of objectivity to workload-placement decisions, lessening the impact of internal turf battles and inter-departmental feuds.

A trusted partner also will have aggregated technical expertise and a view to upcoming developments far in excess of any organization's staff. The right partner will take a holistic perspective of an organization's IT environment and implement a workload-centric approach to IT transformation that takes into account an array of considerations, including enterprise and application security, application lifecycles, TCO, compliance requirements and digital business imperatives.



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Determining the optimal workload placement when considering options spanning public, private, SaaS and traditional IT is complicated and can take time, resources and expertise to make a sound decision. In today's idea economy, speed and agility are key to accelerate the business and remain competitive. Wait too long to take action or select the wrong deployment option, this can have lasting and negative consequences.

It is imperative that enterprises start by developing a solid strategy and plan that incorporates both private and public cloud computing resources while integrating with traditional IT resources. A hybrid infrastructure combines traditional deployments with public, private cloud resources, blending hybrid cloud with traditional IT. Hewlett Packard Enterprise (HPE) believes a hybrid infrastructure strategy is required to define your right mix of cutting-edge infrastructure, power your right mix with the best internal and external resources and optimize your right mix with leading management tools to ensure success every step of the way.

START BY DEFINING YOUR RIGHT MIX

As part of this plan, you need to look at each workload and analyze which platform is best, based on criteria specific to your industry and business. To define your right mix and identify the right placement for a given workload, there are a multitude of factors to weigh, such as:

- **Business:** SLAs, compliance, security and privacy requirements, data sovereignty, and time to market
- **Financial:** Hosting, licensing, contractual terms and conditions, infrastructure, Capex/Opex, ROI and TCO
- **Technical:** Application characteristics, performance, availability, reliability, user experience, redundancy, complexity and criticality

It's important to identify the correct list of factors unique to your industry and business. From here, deriving answers for each of the requirements for each workload will help you prioritize and then be able to determine the ideal deployment platform to use. The right mix of private cloud, public cloud and traditional IT is different for every company and every industry, and there is no one-size-fits-all solution. But getting started on defining your right mix is critical to staying ahead of the competition and will transform your IT resources into a strategic advantage for your business.

As you think about your right mix of hybrid IT infrastructure, start by working with a vendor that has extensive experience helping organizations transform their IT and is committed to your success.

HOW HEWLETT PACKARD ENTERPRISE (HPE) CAN HELP

HPE has significant experience working with global organizations to transform their IT and has helped more than 3,000 customers around the world with defining, powering and optimizing their right mix of hybrid IT infrastructure. HPE has the products, solutions, services and expertise to help you create a flexible, open and secure hybrid cloud for your success.

Where no clear strategy for moving to a hybrid IT is in place, the Cloud Workshop can help customers to quickly focus on top priorities and outcomes, and gain stakeholder engagement. The Strategic Roadmap service provides the overall business, technical and organizational plan for a transformation program.

If you need help to place your workloads, HPE Workload Portability Services will discover, analyze, map, migrate and optimize the portfolio of workloads to your right mix. After the discovery phase, the suitability and mapping services enable customers to gauge workload suitability against targeted cloud platforms. This service allows customers to forecast how feasible it is to host an application in a given cloud platform and whether there will be a benefit to migration. Customers can use multiple business, technical, financial and functional criteria to rationalize workloads against and identify cloud fit.

HPE's unique automated workload rationalization processes allow customers to focus on more critical business and technical priorities. The process of identifying and classifying workloads suitable to multiple industry standard cloud targets is accelerated using HPE's workload suitability and mapping engine, which automates the cumbersome process of workload rationalization. Using these tools, customers can rapidly create cloud workload portability blueprints, which can be used as a baseline toward successful cloud-migration projects. Suitability analysis also takes into account multiple operating and deployment models, and cost-benefit analysis to forecast cloud transformation ROI.

Workload mapping encompasses consulting and tool-based automation capabilities that position a workload to its right cloud target and makes recommendations toward using the suitable mix of cloud infrastructure and services. These recommendations are used by HPE consultants to create a cloud-migration design for a successful migration execution.

Wherever you are on your cloud journey, HPE and a growing list of skilled and reliable partners has the expertise to help organizations assess your applications and workloads for the right cloud destination, plan your cloud strategy and define which cloud is right for you as you transform to hybrid IT. To learn more, please visit

[HTTPS://WWW.HPE.COM/CLOUD](https://www.hpe.com/cloud)